Listing of Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-37 (Canceled)

38. (Canceled)

39. (Canceled)

40. (Currently Amended) An electron source as recited in claim [[39]]51, wherein said nano-structures are substantially vertical.

41. (Currently Amended) An electron source as recited in claim [[39]]51, wherein said nano-structures are individually spaced apart.

42. (Currently Amended) An electron source as recited in claim [[39]]51, wherein said emitter-to-gate distance for each nano-structure is substantially less than one micrometer.

43. (Currently Amended) An electron source as recited in claim [[39]]51, wherein the nano-structures have a surface density substantially higher than $10^6/cm^2$.

44. (Currently Amended) An electron source as recited in claim [[39]]51, wherein the nano-structures protrude above the surface of the emitting layer for not more than half of one micrometer.

45. (Currently Amended) An electron source as recited in claim [[39]]51, wherein the apertures in the insulator expose the entire protrusion portion of the nano-structures in the emitting layer.

46. (Currently Amended) An electron source as recited in claim [[39]]51, wherein the nano-structures have at least one of their three dimensions in the nanometer range.

47. (Currently Amended) An electron source as recited in claim [[39]]51, wherein the nano-structures include nano-tubes, nano-wires, nano-fibers, and nano-cones.

48. (Currently Amended) An electron source as recited in claim [[39]]51, wherein the nano-structures have a coating for enhanced field emission performance.

49. (Currently Amended) A[[n electron source]] display as recited in claim [[39]]64, wherein the nano-structures are selected from a group of materials consisting of carbon, refractory metals and alloys, conductive ceramics, conductive ceramic composites, and doped semiconductors.

50. (Currently Amended) A display [[An electron source]] as recited in claim 49, wherein the carbon includes carbon nano-tube, carbon nano-fiber, and carbon nano-cone.

51. (Currently Amended) [[An electron source as recited in claim 39,]]An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein the nano-structures comprise a nonconductive core and a conductive shell.

52. (Currently Amended) [[An electron source as recited in claim 51,]]An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein the nano-structures comprise a nonconductive core and a conductive shell; and

wherein the nonconductive core is made from one of wide band gap semiconductors, including diamond, BN, AlN, AlGaN, GaN, GaAs, SiC, and ZnO.

53. (Currently Amended) An electron source as recited in claim [[39]]51, wherein the embedding material is comprised of at least two layers.

54. (Previously Presented) An electron source as recited in claim 53, wherein the first layer of the embedding material is conductive.

55. (Currently Amended) [[An electron source as recited in claim 39,]] An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein the insulator and the embedding material are composed of the same dielectric material.

56. (Currently Amended) [[An electron source as recited in claim 39,]]An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein said insulator functions also as the embedding material.

57. (Currently Amended) An electron source as recited in claim [[39]]51,

wherein the cathode electrode is configured as a plurality of electrically isolated cathode electrodes, each for supplying an independent source of electrons;

wherein the gate electrode is configured as a plurality of electrically isolated electrodes, each intersecting with said cathode electrodes and having one or a plurality of apertures at each intersections, each gate electrode being operative to control the emission of electrons through the apertures along the gate electrode; and

wherein activation of a selected cathode and a selected gate electrode determines an intersection where the nano-structures emit electrons.

58. through 63. (Canceled)

64. (Previously Presented) A display comprising:

an electron source that includes:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures; and

an anode plate including a transparent anode electrode disposed over a glass substrate and a phosphor screen disposed over the anode electrode, the anode plate being positioned opposite to said electron source with a vacuum gap disposed therebetween;

wherein electrons are emitted from said nano-structures by applying a voltage between said cathode and gate electrodes, and are made incident on said phosphor screen to make luminous said phosphor screen.

65. (Previously Presented) A display as recited in claim 64, wherein the nano-structures are substantially vertical.

66. (Previously Presented) A display as recited in claim 64, wherein the emitter-to-gate distance for each emitter is substantially less than one micrometer.

67. (Previously Presented) A display as recited in claim 64, wherein the nano-structures have a surface density substantially higher than $10^6/cm^2$.

68. (Previously Presented) A display as recited in claim 64,

wherein the cathode electrode is configured as a plurality of strip-like cathode electrodes extending substantially in the same direction in such a manner as to be spaced from each other at intervals in the transverse direction, each cathode strip for providing an independent source of electrons;

wherein the gate electrode is configured as a plurality of strip-like gate electrodes extending in such a manner as to intersect said plurality of cathode electrodes and to be spaced from each other at intervals in the transverse direction, and having one or a plurality of apertures at each intersection, each gate electrode for controlling the emission of electrons through the apertures along the gate electrode; and

wherein the anode electrode is configured as a plurality of strip-like anode electrodes each extending in such a manner as to be opposed to the corresponding one of said gate electrodes.

69. (Canceled)

70. (Currently Amended) [[An electron source as recited in claim 69,]] An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein said nano-structures in the emitter layer are truncated to substantially the same length, so that each exposed nano-structure in the gate aperture has substantially the same gate-to-emitter distance; and

wherein said nano-structures are truncated by chemical mechanical planarization.

71. (Currently Amended) An electron source as recited in claim [[39]]51, wherein said nano-structures are grown using a template and said template is at least part of the embedding material.

72. (Canceled)

73. (Canceled)

74. (Currently Amended) An electron source as recited in claim [[63]]51, wherein said nano-structures are truncated to substantially the same length.

75. (Previously Presented) A display as recited in claim 64, wherein said nano-structures in the emitter layer are truncated to substantially the same length, so that each exposed nano-structure in the gate aperture has substantially the same gate-to-emitter distance.

76. (New) A display as recited in claim 64, wherein the nano-structures have at least one of their three dimensions in the nanometer range.

77. (New) A display as recited in claim 64, wherein the nano-structures include nano-tubes, nano-wires, nano-fibers, and nano-cones.

78. (New) A display as recited in claim 64, wherein the nano-structures have a coating for enhanced field emission performance.

79. (New) A display as recited in claim 64, wherein the nano-structures comprise a nonconductive core and a conductive shell.

80. (New) A display as recited in claim 79, wherein the nonconductive core is made from one of wide band gap semiconductors, including diamond, BN, AlN, AlGaN, GaN, GaAs, SiC, and ZnO.

81. (New) A display as recited in claim 64, wherein said nano-structures are individually spaced apart.

82. (New) A display as recited in claim 64, wherein the embedding material is comprised of at least two layers.

83. (New) A display as recited in claim 82, wherein the first layer of the embedding material is conductive.

84. (New) A display as recited in claim 64, wherein the insulator and the embedding material are composed of the same dielectric material.

85. (New) A display as recited in claim 64, wherein said insulator functions also as the embedding material.

86. (New) A display as recited in claim 64, wherein said nano-structures are grown using a template and said template is at least part of the embedding material.